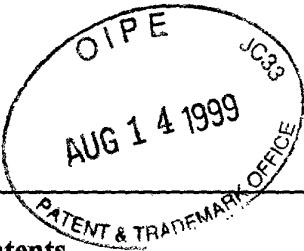


418 Rec'd PCT/EP97/02155
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09/367519



Assistant Commissioner for Patents
Washington D.C. 20231

(EXPRESS MAIL POST OFFICE TO ADDRESSEE Mailing Label No. EJ571119259US)

Request for Entry into National Stage in the United States of America as an Elected Office
under 35 U.S.C. 371 and 37 CFR 1.495

Sir,

Applicant herewith makes a submission for entering the U.S. National Stage as an Elected Office under 35 U.S.C. 371 of the following International Application:

International Application No. PCT/EP97/02155

Applicant: MEZZALIRA, Rinaldo

International Filing Date: 25 April 1997

Agent's Ref.: 1066

A copy of the Published International Application PCT/EP97/02155 is attached. A combined Declaration/Authorization, and Assignment (with Assignment Recordation Cover Sheet), both duly executed by the inventor, are attached. A Small Entity Statement duly executed by the Assignee is attached. A check in the amount of US\$ 460.00 to cover the basic national fee under 37 CFR 1.492(a)(5) (US\$ 420.00) and assignment recording fee (US\$ 40.00) is attached.

Please address all future correspondence to:

Daniel O'Byrne
Via del Parione, 8
50123 FLORENCE, ITALY (EUROPE)

Please mark on the file wrapper that all correspondence for this application should be marked with an AIR MAIL label or stamp, since applicant and his agent are residing overseas, as has been established by the current practice on instructions from the Commissioner of Patents and Trademarks.

Respectfully submitted,

Daniel O'Byrne (Reg. No. 36,625)
Agent for the Applicant

Date: 13 August 1999

Address: Via del Parione, 50123 FLORENCE-ITALY

Telephone: (from USA) (011)(39)(055)282-261

encl.: -Copy of Published International Application PCT/EP97/02155.

-Declaration/Authorization.

-Assignment and Assignment Recordation Cover Sheet.

-Small Entity Statement.

-Check (US\$ 460.00).

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS
37 CFR 1.9(f) and 1.27(c)--SMALL BUSINESS CONCERN

I hereby declare that I am

[] the owner of the small business concern identified below:

[] an official empowered to act on behalf of the small business concern identified below:

NAME OF CONCERN: **FITT S.P.A.**

ADDRESS: **Via Piave, 4 36066 Sandrigo, ITALY**

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under 41(a) and (b) of Title 35, U.S. Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention entitled: **REINFORCED FLEXIBLE HOSE**, by inventor **MEZZALIRA Rinaldo**, described in **PCT International Application No. PCT/EP97/02155, filed on 25 April 1997**.

If the rights held by the above-identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(d) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e). *Note: separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

Name: NONE

Address: _____

[] individual [] small business concern [] nonprofit organization

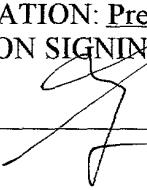
I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 1001 of Title 18 of the U.S. Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING: MEZZALIRA Rinaldo

TITLE IN ORGANIZATION: President

ADDRESS OF PERSON SIGNING: Via Breganzola, 3 36057 Arcugnano (IT)

SIGNATURE:  DATE: 30 July 1999

- 1 -

REINFORCED FLEXIBLE HOSE

The present invention relates to a flexible hose made of plastic or reinforced rubber, with a tubular braiding made 5 of fabric which can be used in the field of irrigation or in the field of the delivery of pressurized fluids in open or closed circuits.

Conventional flexible hoses of the above described type are 10 generally formed by a first tubular inner layer, made of plastic or rubber, on which a tubular fabric is applied for increasing the pressure resistance of the flexible hose, reducing its deformation and increasing its performance.

15 One of the most widespread and most suitable conventional hose is the so-called "mesh-reinforced" type, in which the tubular reinforcement fabric is constituted by a series of threads spirally wound on the flexible hose in parallel and equidistant rows and superimposed on an equal number of 20 transverse threads along likewise parallel and equidistant lines which are arranged symmetrically with respect to the axis of the hose so as to form a mesh with diamond-shaped cells.

25 The fabric surrounding the outer surface of the inner layer of plastic is then covered by a further outer layer of plastic or rubber which is generally but not necessarily transparent and fixes the meshed fabric to the flexible hose and protects it. With this type of braiding, the 30 flexible hose is suitable to withstand a higher pressure

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than the hose without braiding and to reduce its deformation, because the weaving is of the non-stretch type and therefore prevents the inner layer from deforming.

- 5 A drawback of the above described mesh-reinforced hose is the fact that its flexibility is relatively limited; that is to say, the bending radiiuses to which the hose can be subjected are rather wide with respect to knit hoses.
- 10 Another conventional type of flexible hose is the one in which the braiding that surrounds the outer part of the hose is formed by knitting instead of weaving.

EP-A-0 527 512, in the name of this same Applicant, discloses a hose provided with a particular knit reinforcement in which the individual stitches are shaped like trapezoidal loops with filaments which interweave in the corners. This type of knit reinforcement has the virtue of making the hose stronger than similar knit flexible hoses.

It is known that knitting is a special weaving which is obtained by means of one or more threads which are mutually linked with more or less complex turns, also known as loops or basic stitches, which give the knit fabric great elasticity.

So-called chain knitting is constituted by a series of mutually parallel threads which are fed by multiple spools and are curved so as to form an equal number of lines of

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stitches which are interlocked both in the weft direction and in the chain direction; their interweaving produces a transverse series of rows of stitches and a longitudinal series of lines of stitches or cords.

5

One of the commercially most frequent flexible hoses is the one in which the knitting is of the tricot chain type, where this term describes a stitch in which each thread forms the stitch by interweaving with one or more threads 10 to its right and with one or more threads to its left.

Although, on one hand, the flexible hose with tricot knitting is more flexible, since notoriously the knitting yields as the diameter of the hose increases because of the 15 pressure increase, on the other hand the shortcoming of knitted fabric, and especially of tricot-knitted fabric, is that as the pressure increases, the hose is subjected to a torsional effect by the fluid which flows under pressure inside it. This is due to the helical orientation of the 20 rows of stitches which, by contrast with the substantially longitudinal orientation of the lines, cause an unbalanced reaction, and particularly torque, in the hose.

EP-A-0 623 776 in the name of this same Applicant discloses 25 a hose which includes, from the inside outward: an inner layer of plastic or rubber which has an outer surface; a chain-knit part, which has rows and lines of stitches, and has a tubular shape and is wound in a single layer around the outer surface of the inner layer; and an outer stitch 30 protection layer; wherein the lines and rows of stitches

- 4 -

are inclined in opposite directions with substantially the same inclination with respect to the longitudinal axis of the hose in order to eliminate the effects of the torque produced by the pressure loads inside the hose.

5

This prior patent provides no correlation among the various parameters of the knit reinforcement part, such as the pitch, the inclination and the thread count per unit length, neither among them or with respect to the dimensional parameters of the inner layer. Accordingly, due to the large number of parameters involved and to their large number of possible combinations, the person skilled in the art does not have all the information required to assuredly achieve the intended results or at least optimize 15 the anti-torque effect of the hose.

An aim of the present invention is to eliminate the above described drawbacks.

20 A further aim of the invention is to provide a correlation between the various parameters of the braiding and those of the inner layer, such as to eliminate the torque produced on the knitted fabric by the pressure of the fluid, without thereby renouncing flexibility and bursting pressure 25 resistance characteristics.

This aim and other objects which will become apparent hereinafter are achieved by a flexible hose according to the invention, which in accordance with the content of the first claim includes: at least one inner tubular layer of 30

- 5 -

plastic or rubber which has an outside diameter and a longitudinal axis; a knitted reinforcement of the chain type, which has rows of substantially parallel stitches and lines of substantially parallel stitches with respective 5 stitch counts per unit length in a longitudinal direction, the knitted reinforcement layer being provided in the form of a single tubular layer and being wrapped around the outer surface of the inner tubular layer coaxially thereto, the rows and lines of stitches being substantially helical 10 with respective longitudinal pitches and inclinations which are mutually opposite with respect to the longitudinal axis, so as to eliminate the torque applied by the pressure of the fluid inside it; and an outer layer which is superimposed on the reinforcement layer to protect it; 15 characterized in that the longitudinal pitch of the lines of stitches is substantially proportional to the square of the outside diameter of the inner layer.

Surprisingly, it has been found that in order to eliminate 20 the torque induced by the internal pressure of the fluid, the pitch of the lines of stitches must increase as the inner diameter but not according to a linear relation but rather according to a quadratic relation, in order to effectively contrast the rotation induced by the uncoiling 25 of the helical threads of the stitches.

At the same time, the longitudinal pitch of the rows of stitches can be kept substantially constant and independent of the outside diameter of the inner layer.

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Preferably, the number of lines of stitches per unit length of the hose is directly proportional to the outside diameter of the inner layer.

5 Further characteristics and advantages of the present invention will become apparent from the following description of a preferred embodiment of the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

10

Figure 1 is a view of a portion of the flexible hose according to the invention;

Figure 2 is a sectional view of the hose of Figure 1;

15

Figure 3 is a diagram showing the main parameters of the chain knitting of the reinforcement braiding according to the invention with respect to the outside diameter of the inner layer.

20

With reference to the above figures, the flexible hose according to the invention, generally designated by the reference numeral 1, is formed by an inner layer 2 made of polymeric or elastomeric material such as PVC, natural or synthetic rubber, which is essentially tubular and has a longitudinal axis Y which coincides with the axis of the flexible hose, an inner surface which has an inside diameter ϕ_i , and an outer surface which has a diameter ϕ_o .

25 30 A chain-knitted part, generally designated by the reference

- 7 -

numeral 3, is knitted on the inner layer 2 and is formed by substantially helical rows 4 of stitches, which are mutually parallel and have an inclination angle α with respect to the axis Y of the hose 10 of Figure 2, and by 5 lines 5 which are also substantially helical and have an inclination angle β with respect to the axis Y, but in the opposite direction with respect to the rows 4.

The rows and lines have respective longitudinal pitches P_m 10 and P_r . Furthermore, the linear count or number of lines per unit length (100 mm) of the rows or stitches is respectively N_m and N_r .

It is known that if the outside diameter ϕ_o of the inner 15 layer 2 on which the braiding 3 is wound increases, it is necessary to increase the pitch of the lines in order to be able to contain the torque. However, until now a precise correlation between these parameters had not been established. Surprisingly, tests and experiments have 20 allowed to verify that the relation between these parameters is not linear but is instead quadratic.

In other words, this relation can be expressed by the general formula:

25

$$P_r = K \phi^2 \quad (1)$$

where the parameter K depends on the materials and units of measure used.

30

- 8 -

In the case of PVC and if all parameters are expressed in mm, the constant K of formula (1) is generally between 0.35 and 0.50 mm^{-1} and is preferably equal to approximately 0.45 mm^{-1} .

5

It is noted that the knitted reinforcement of the hose of Figure 1 is formed by chain stitches of the tricot type. These stitches are formed directly on the hose by so-called knitting machines which are commercially available and 10 whose stitch-forming method is well-known.

With this crossed and inclined arrangement with respect to the axis Y of the hose, the torque which occurs on the hose in case of normal chain stitches, for example with 15 substantially longitudinal lines, is canceled out. On the contrary, by arranging the lines transversely instead of longitudinally the rotary force component which appeared due to the coiling of the spiral-shaped rows 5 is compensated.

20

With this type of knitting, the forces produced by the lines and rows of stitches mutually compensate until they cancel each other out, thus making the hose 1 substantially 25 insensitive to the torque induced by the pressure of the fluid inside the hose.

It is noted instead that the longitudinal pitch P_m of the rows of stitches can be kept substantially constant and independent of the outside diameter ϕ_o of the inner layer.

30

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Furthermore, the number N_r of lines of stitches per unit length of the hose is substantially directly proportional to the outside diameter ϕ_o .

- 5 The angles α and β are generally mutually different, but their sum is approximately constant and equal to, or slightly smaller than, 90° as the value of the outside diameter ϕ_o of the inner layer 2 varies.
- 10 In particular, it has been observed that the inclination angle β of the lines of stitches 5 is substantially proportional to the square root of the outside diameter ϕ_o of the inner layer 2.
- 15 When using values between 12 and 37 mm for the outside diameter ϕ_o and between 10 and 32 mm for the inside diameter ϕ_i , it has been observed that the number of rows per unit length N_m is substantially constant and is between 30 and 40 rows per 100 mm, with an average value of 35 rows
- 20 per 100 mm.

In the same conditions, the number of lines per unit length N_r is substantially proportional to the outside diameter ϕ_o of the inner layer 2 and is between 10 and 16 rows per 100 mm.

The above parameters are summarized in Table I below and most of them have been plotted in the chart of Figure 3.

- 10 -

TABLE I

	Outside diameter of inner layer δ_o (mm)	Inside diameter of inner layer ϕ_i (mm)	Pitch of rows P_r (mm)	Pitch of lines P_m (mm)	Inclination angle of lines (°)	Inclination angle of rows (°)	No. of lines per unit length N_r (n/100mm)	No. of rows per unit length N_m (n/100mm)
5	12.5	10	70	22.7	60	30	10	35
	15	12.5	100	22.7	64	26	10/12	35
	18	15	140	22.7	68	22	12	35
	22.5	19	220	22.7	72	18	12	35
	29.5	25	380	22.7	76	14	16	35
	37	32	600	22.7	79	11	16	35
10								

Finally, an outer layer 6 made of plastic or rubber locks the chain knitting thus formed on the surface of the hose, as occurs besides in all known flexible hose structures.

15

It is important to note that the inclination of the lines and rows of stitches can be slightly modified with respect to the above indicated values according to the material of the hose, its diameter, the type of knitting, the number of spools, the pitch of the rows and lines, and the type and/or count of the thread.

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CLAIMS

1. Reinforced flexible hose, comprising:

at least one inner tubular layer (2) of plastic or rubber
5 which has an outside (ϕ_e) diameter and a longitudinal axis
(Y);

a chain knitted-type reinforcement layer (3), which has
rows (4) of substantially parallel stitches and lines (5)
10 of substantially parallel stitches, with respective stitch
counts per unit length (N_m , N_r) in a longitudinal
direction;

said knitted reinforcement layer (3) being provided in the
15 form of a single tubular layer and being formed on the
outer surface of said inner tubular layer (2) coaxially
thereto;

said rows (4) of stitches and said lines (5) of stitches
20 being substantially helical with respective longitudinal
pitches (P_m , P_r) and inclinations (α , β) which are mutually
opposite with respect to the longitudinal axis (Y), so as
to eliminate the torque applied by the pressure of the
fluid inside it; and

25

an outer layer (6) which is superimposed on said
reinforcement layer (3) to protect it;

characterized in that the longitudinal pitch (P_r) of said
30 lines (5) of stitches is substantially proportional to the

- 12 -

square of the outside diameter (ϕ_o) of said inner layer (2).

2. Flexible hose according to claim 1, characterized in
5 that the number of lines of stitches per unit length (N_r)
is substantially directly proportional to the outside
diameter (ϕ_o) of said inner layer (2).

3. Flexible hose according to claim 1, characterized in
10 that the longitudinal pitch (P_m) of the rows of stitches is
substantially constant and independent of the outside
diameter (ϕ_o) of said inner layer (2).

4. Flexible hose according to claim 1, characterized in
15 that said rows (4) and said lines (5) of substantially
helical stitches have different inclination angles (α , β)
whose sum is substantially constant and equal to, or
slightly lower than, 90° as the value of the outside
diameter (ϕ_o) of said inner layer (2) varies.

20

5. Flexible hose according to claim 4, characterized in
that the angle of inclination (β) of the lines (5) of
stitches is substantially proportional to the square root
of the outside diameter (ϕ_o) of said inner layer (2).

25

6. Flexible hose according to claim 1, characterized in
that in said inner layer (2) the outside diameter (ϕ_o) is
between 12 and 27 mm and the inside diameter (ϕ_i) is
between 10 and 32 mm.

30

- 13 -

7. Flexible hose according to claim 1, characterized in that the number of rows per unit length (N_m) is substantially constant as the outside diameter (ϕ_o) of said inner layer (2) varies, and is between 30 and 40 rows per 5 100 mm, with an average number of 35 rows per 100 mm.

8. Flexible hose according to claim 1, characterized in that the number of lines per unit length (N_r) is substantially proportional to the outside diameter (ϕ_o) of 10 said inner layer (2) and is between 10 and 16 lines per 100 mm.

1/1

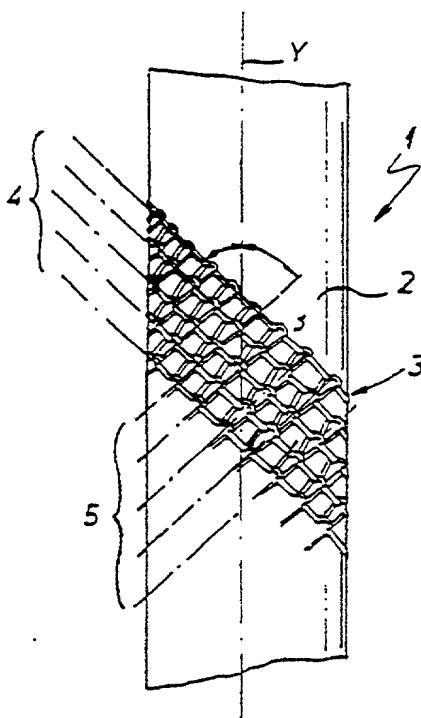


FIG. 1

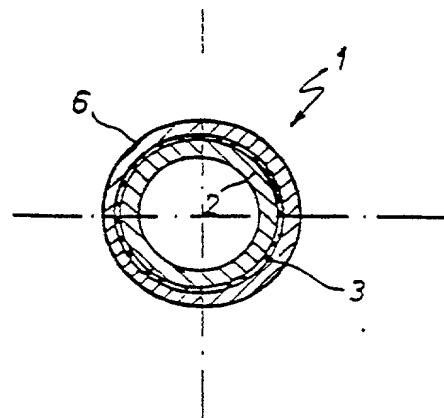


FIG. 2

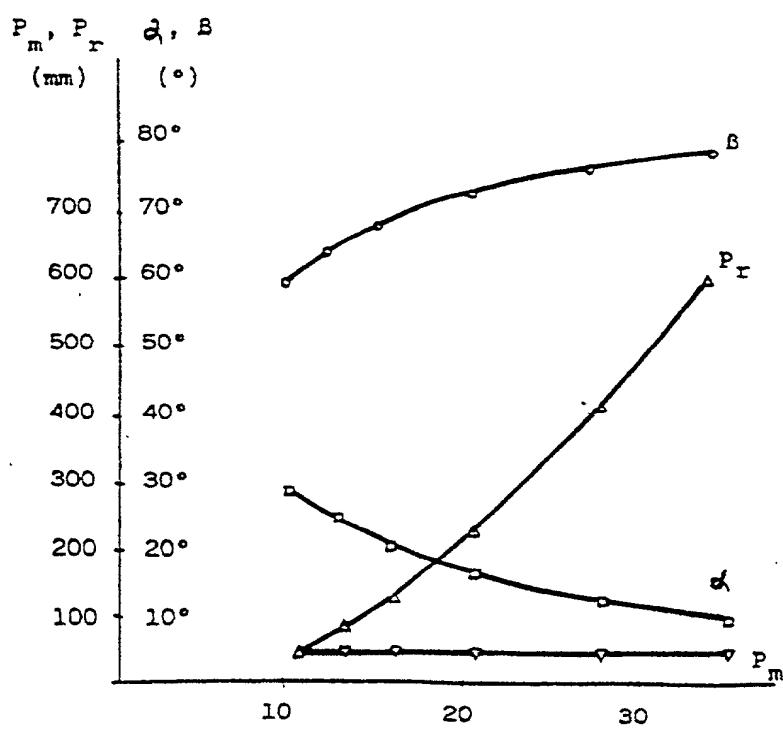


FIG. 3

Italian Language Declaration

Con il presente rivendico il beneficio previsto dal Titolo 35, Codice degli Stati Uniti, Comma 120 per qualsiasi domanda (o domande) di brevetto statunitense, o Comma 365(c) per qualsiasi domanda (o domande) internazionale PCT designando gli stati uniti, sotto indicata, ed entro i limiti nei quali il materiale indicato in ciascuna delle rivendicazioni di questa domanda non è stato rivelato nella precedente domanda (o nelle precedenti domande) statunitense o internazionale PCT nel modo previsto dal primo paragrafo del Titolo 35, Codice degli Stati Uniti, Comma 112, riconosco il mio dovere di rivelare informazione che è rilevante all'essere brevettabile, così come viene definito nel Titolo 37, Codice dei Regolamenti Federali, Comma 1.56, che possa essere venuta disponibile nel periodo intercorso tra la data di presentazione della domanda (o delle domande) precedente e la data nazionale o internazionale PCT di presentazione di questa domanda

PCT/EP97/02155

(Application Number)
(Numero della Domanda)

25 April 1997

(Filing Date)
(Data di Presentazione)

(Application Number)
(Numero della Domanda)

(Filing Date)

(Data di Presentazione)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s), or §365(c) of any PCT International application(s) designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application(s) in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application(s) and the national of PCT International filing date of this application.

Pending, In attesa di brevetto

(Status- patented, pending, abandoned)

(Stato Giuridico – brevettato,in attesa di brevetto, abbandonato)

(Status- patented, pending, abandoned)

(Stato Giuridico – brevettato,in attesa di brevetto, abbandonato)

Dichiaro inoltre con il presente che tutte le informazioni da me fornite sono in fede mia vere, e che tutte le affermazioni da me fatte sono in fede mia vere; dichiaro inoltre che quando ho fatto queste affermazioni ero al corrente del fatto che false dichiarazioni fatte intenzionalmente sono punibili con multa o incarcerezioni, o ambedue, secondo quanto stabilito dalla sezione 1001 del Titolo 18 del Codice degli Stati Uniti, e che tali informazioni intenzionalmente false possono mettere a repentaglio la validità della domanda o di qualsiasi brevetto rilasciato in base ad essa.

PROCURA: Io, sottoscritto inventore, nomino con la presente il seguente Procuratore (o Procuratori) e/o Agente (o Agenti) che s'incarica di perseguire questa pratica e di portare a termine tutte le operazioni necessarie all'Ufficio Brevetti e Marchi di Fabbrica pertinenti a questa pratica.

Daniel J. O'Byrne (Reg. No. 36,625)

Recapito per la Corrispondenza

Send Correspondence to:

Daniel J. O'Byrne
Via del Parione, 8
50123 Florence, Italy EUROPE

Telefonare a:

Direct Telephone Calls to:

tel.: (001) 39.055 282-261
fax: (001) 39.055 265-0350

Declaration and Power of Attorney for Patent Application
Modulo di Dichiarazione Per Domanda di Brevetto
Italian Language Declaration

Io, sottoscritto inventore, dichiaro con il presente che:

Il mio domicilio, recapito postale e cittadinanza sono quelli indicati in calce accanto al mio nome

Che mi reputo in buona fede esse l'inventore originario, primo e unico (qualora un solo nominativo appaia elencato appresso) o il coinventore primo e originario (qualora i nomintivi siano più di uno) dell'invenzione da me rivendicata, e per la quale faccio domanda di brevetto. Tale invenzione è chiamata
STRUTTURA DI TUBO FLESSIBILE RINFORZATO.

e la sua descrizione è:

stata presentata il 25 aprile 1997 come Domanda Internazionale PCT Numero PCT/EP97/02155.

Dichiaro inoltre con il presente di aver letto e compreso il contenuto della specificazione sopra indicata, comprese le rivendicazioni, come rettificata da qualsiasi emendamento a cui si sia accennato sopra.

Riconosco il mio dovere di rivelare informazione che è rilevante all'essere brevettabile secondo i termini del Titolo 37, Codice dei Regolamenti Federali, Comma 1.56.

Con il presente rivendico i benefici di priorità per l'estero come stabilito dal Titolo 35, Codice degli Stati Uniti, Comma 119(a)-(d) o Comma 365(b), per qualsiasi domanda (o domande) di brevetto straniera o per qualsiasi certificato d'invenzione o per qualsiasi domanda (o domande) internazionale PCT designando almeno un paese altro che gli Stati Uniti, sotto elencato, ed ho anche elencato qui sotto tutte le domande di brevetto e certificati d'invenzione stranieri e domande internazionali PCT aventi una data di presentazione anteriore a quella della domanda (o delle domande) per la quale (o per le quali) si rivendica la precedenza:

Prior foreign application(s)
Domande dall'estero precedenti

VI97A000031

(Number)
(Numer)

ITALY

(Country)
(Paese)

20/02/1997

(Day/Month/Year Filed)
(Giorno/Mese/Anno di Presentazione)

Yes No
Si No

(Number)
(Numer)

(Country)
(Paesi)

(Day/Month/Year Filed)
(Giorno/Mese/Anno di Presentazione)

Yes No
Si No

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

REINFORCED FLEXIBLE HOSE.

the specification for which:

was filed on 25 April 1997 as PCT International Application Number PCT/EP97/02155.

I hereby state that I have reviewed and understood the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application (s) designating at least one country other than the United States, listed below, and I have also identified below any foreign application(s) for patent or inventor's certificate, or PCT International application(s), having a filing date before that of the application(s) on which priority is claimed.

Priority claimed
Precedenza Rivendicata

Italian Language Declaration

Full name of sole inventor or first joint inventor (Nome completo dell'inventore unico o del primo coinventore)
MEZZALIRA, Rinaldo

Inventor's Signature (Firma dell'inventore)

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Date (Data)

30 July 1999

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Inventor's Signature (Firma dell'inventore)

Date (Data)

Residence (Residenza)

Citizenship (Cittadinanza)

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Date (Data)

Residence (Residenza)

Citizenship (Cittadinanza)

Post Office Address (Recapito a Casella Postale)

Note to inventor(s): please sign exactly as your name appears, and insert the actual date of signing
Per inventore: firmare esattamente come il suo nome appare, e compilare la data attuale della firma